

# Union Calendar No. 529

114TH CONGRESS  
2D SESSION

# H. R. 5640

[Report No. 114-681]

To provide for the establishment at the Department of Energy of an Electricity Storage Basic Research Initiative.

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## IN THE HOUSE OF REPRESENTATIVES

JULY 6, 2016

Mr. SMITH of Texas (for himself, Mr. LIPINSKI, Mr. WEBER of Texas, Mr. KNIGHT, Mr. NEUGEBAUER, Mr. HULTGREN, Mr. POSEY, Mr. MOOLENAAR, and Mr. BABIN) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

JULY 11, 2016

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in italic]

[For text of introduced bill, see copy of bill as introduced on July 6, 2016]

# A BILL

To provide for the establishment at the Department of Energy of an Electricity Storage Basic Research Initiative.

1       *Be it enacted by the Senate and House of Representa-*  
2   *tives of the United States of America in Congress assembled,*  
3   **SECTION 1. SHORT TITLE.**

4       *This Act may be cited as the “Electricity Storage In-*  
5   *novation Act”.*

6   **SEC. 2. ELECTRICITY STORAGE BASIC RESEARCH INITIA-**  
7                   **TIVE.**

8       *(a) AMENDMENT.—Section 975 of the Energy Policy*  
9   *Act of 2005 (42 U.S.C. 16315) is amended to read as fol-*  
10   *lows:*

11   **“SEC. 975. ELECTRICITY STORAGE BASIC RESEARCH INITIA-**  
12                   **TIVE.**

13       “(a) INITIATIVE.—

14       “(1) IN GENERAL.—*The Secretary shall carry*  
15   *out a research initiative, to be known as the Elec-*  
16   *tricity Storage Basic Research Initiative, to expand*  
17   *theoretical and fundamental knowledge to control,*  
18   *store, and convert electrical energy to chemical energy*  
19   *and the inverse. This initiative shall support sci-*  
20   *entific inquiry into the practical understanding of*  
21   *chemical and physical processes that occur within*  
22   *systems involving crystalline and amorphous solids,*  
23   *polymers, and organic and aqueous liquids.*

24       “(2) LEVERAGING.—*The Secretary shall leverage*  
25   *expertise and resources from the Basic Energy*

1       *Sciences Program, Advanced Scientific Computing*  
2       *Research Program, and Biological and Environ-*  
3       *mental Research Program within the Office of*  
4       *Science, and the Office of Energy Efficiency and Re-*  
5       *newable Energy, as provided under subsections (b),*  
6       *(c), and (d).*

7           “(3) TEAMS.—The Secretary shall organize ac-  
8       *tivities under the Electricity Storage Basic Research*  
9       *Initiative to include multidisciplinary teams*  
10      *leveraging expertise from the National Laboratories,*  
11      *universities, and the private sector to the extent prac-*  
12      *ticable. These multidisciplinary teams shall pursue*  
13      *aggressive, milestone-driven basic research goals. The*  
14      *Secretary shall provide sufficient resources for those*  
15      *teams to achieve those goals over a period of time to*  
16      *be determined by the Secretary.*

17          “(4) ADDITIONAL ACTIVITIES.—The Secretary is  
18       *authorized to organize additional activities under this*  
19       *subsection through Energy Frontier Research Centers,*  
20       *Energy Innovation Hubs, or other organizational*  
21       *structures.*

22          “(b) MULTIVALENT SYSTEMS.—

23           “(1) IN GENERAL.—The Secretary shall, as part  
24       *of the Electricity Storage Basic Research Initiative,*  
25       *carry out a program to support research needed to*

1       *bridge scientific barriers and discover knowledge relevant to multivalent ion materials in electric energy*  
2       *storage systems. In carrying out activities under this*  
3       *subsection, the Director of the Office of Basic Energy*  
4       *Sciences shall investigate electrochemical properties*  
5       *and the dynamics of materials, including charge*  
6       *transfer phenomena and mass transport in materials.*  
7  
8       *The Assistant Secretary for Energy Efficiency and*  
9       *Renewable Energy shall support translational re-*  
10      *search, development, and validation of physical con-*  
11      *cepts developed under this subsection.*

12      “(2) STANDARD OF REVIEW.—*The Secretary*  
13      *shall review the program activities under this sub-*  
14      *section to determine the achievement of technical*  
15      *milestones.*

16      “(3) AUTHORIZATION OF APPROPRIATIONS.—

17      “(A) AUTHORIZATION.—*Subject to subsection (e), there are authorized for carrying out*  
18      *activities under this subsection for each of fiscal*  
19      *years 2017 through 2020—*

21      “(i) \$50,000,000 from funds within the  
22      *Basic Energy Sciences Program account;*  
23      *and*

1                   “(ii) \$25,000,000 from funds within  
2                   the Energy Efficiency and Renewable En-  
3                   ergy account.

4                   “(B) PROHIBITION.—No funds authorized  
5                   under this subsection may be obligated or ex-  
6                   pended for commercial application of energy  
7                   technology.

8                   “(c) ELECTROCHEMISTRY MODELING AND SIMULA-  
9                   TION.—

10                  “(1) IN GENERAL.—The Secretary shall, as part  
11                  of the Electricity Storage Basic Research Initiative,  
12                  carry out a program to support research to model and  
13                  simulate organic electrolytes, including their static  
14                  and dynamic electrochemical behavior and phe-  
15                  nomena at the molecular and atomic level in  
16                  monovalent and multivalent systems. In carrying out  
17                  activities under this subsection, the Director of the Of-  
18                  fice of Basic Energy Sciences shall, in coordination  
19                  with the Associate Director of Advanced Scientific  
20                  Computing Research, support the development of high  
21                  performance computational tools through a joint de-  
22                  velopment process to maximize the effectiveness of cur-  
23                  rent and projected high performance computing sys-  
24                  tems. The Assistant Secretary for Energy Efficiency  
25                  and Renewable Energy shall support translational re-

1       *search, development, and validation of physical con-*  
2       *cepts developed under this subsection.*

3           “(2) STANDARD OF REVIEW.—The Secretary  
4        *shall review the program activities under this sub-*  
5       *section to determine the achievement of technical*  
6       *milestones.*

7           “(3) AUTHORIZATION OF APPROPRIATIONS.—

8           “(A) AUTHORIZATION.—Subject to sub-  
9       *section (e), there are authorized for carrying out*  
10      *activities under this subsection for each of fiscal*  
11      *years 2017 through 2020—*

12           “(i) \$30,000,000 from funds within the  
13       *Basic Energy Sciences Program and Ad-*  
14       *vanced Scientific Computing Research Pro-*  
15       *gram accounts; and*

16           “(ii) \$15,000,000 from funds within  
17       *the Energy Efficiency and Renewable En-*  
18       *ergy account.*

19           “(B) PROHIBITION.—No funds authorized  
20       *under this subsection may be obligated or ex-*  
21       *pended for commercial application of energy*  
22       *technology.*

23           “(d) MESOSCALE ELECTROCHEMISTRY.—

24           “(1) IN GENERAL.—The Secretary shall, as part  
25       *of the Electricity Storage Basic Research Initiative,*

1       *carry out a program to support research needed to re-*  
2       *veal electrochemistry in confined mesoscale spaces, in-*  
3       *cluding scientific discoveries relevant to bio-electro-*  
4       *chemistry and electrochemical energy conversion and*  
5       *storage in confined spaces and the dynamics of these*  
6       *phenomena. In carrying out activities under this sub-*  
7       *section, the Director of the Office of Basic Energy*  
8       *Sciences and the Associate Director of Biological and*  
9       *Environmental Research shall investigate phenomena*  
10      *of mesoscale electrochemical confinement for the pur-*  
11      *pose of replicating and controlling new electro-*  
12      *chemical behavior. The Assistant Secretary for En-*  
13      *ergy Efficiency and Renewable Energy shall support*  
14      *translational research, development, and validation of*  
15      *physical concepts developed under this subsection.*

16       “(2) STANDARD OF REVIEW.—The Secretary  
17      *shall review the program activities under this sub-*  
18      *section to determine the achievement of technical*  
19      *milestones.*

20       “(3) AUTHORIZATION OF APPROPRIATIONS.—

21       “(A) AUTHORIZATION.—Subject to sub-

22      *section (e), there are authorized for carrying out*  
23      *activities under this subsection for each of fiscal*  
24      *years 2017 through 2020—*

1                   “(i) \$20,000,000 from funds within the  
2                   *Basic Energy Sciences Program and the Bi-*  
3                   *ological and Environmental Research Pro-*  
4                   *gram accounts; and*

5                   “(ii) \$10,000,000 from funds within  
6                   *the Energy Efficiency and Renewable En-*  
7                   *ergy account.*

8                   “(B) *PROHIBITION.*—No funds authorized  
9                   under this subsection may be obligated or ex-  
10                  pended for commercial application of energy  
11                  technology.

12                  “(e) *FUNDING.*—No additional funds are authorized to  
13                  be appropriated under this section. This section shall be  
14                  carried out using funds otherwise authorized by law.”.

15                  (b) *TABLE OF CONTENTS AMENDMENT.*—The item re-  
16                  lating to section 975 in the table of contents of such Act  
17                  is amended to read as follows:

“Sec. 975. *Electricity Storage Basic Research Initiative.*”.

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